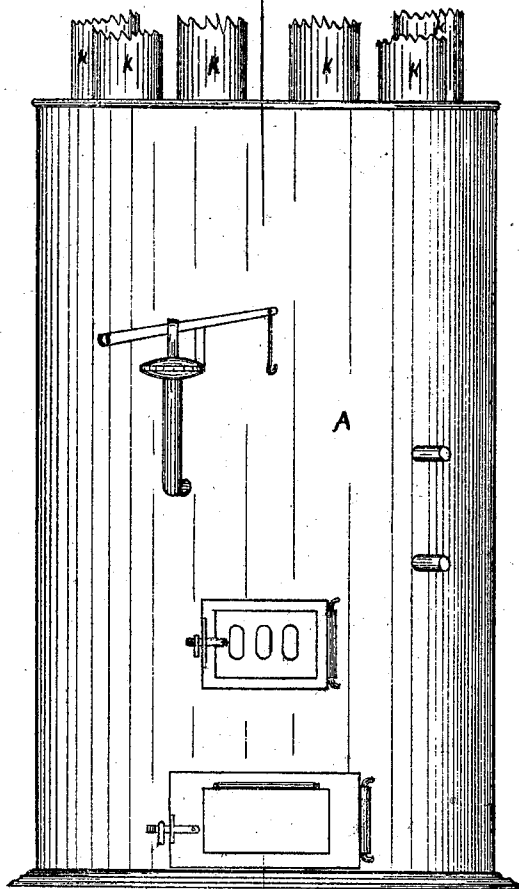
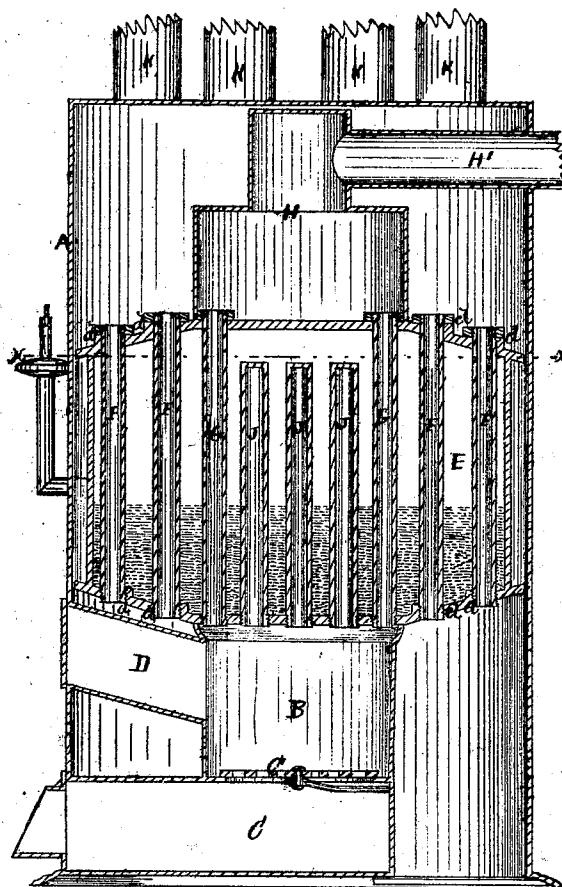


Hazen. Mooers. PATENTED JUN 27 1871  
 116339 Combined Water and Steam Furnace.

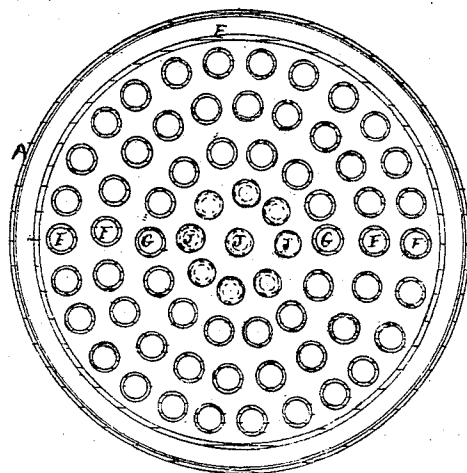
*Fig 1*



*Fig 2*



*Fig 3.*



Witnesses  
*W. H. Sturges*  
*A. C. Gidley*

Inventor  
*Hazen Mooers*  
 By *Darwell H. Co.*  
*his atty.*

# UNITED STATES PATENT OFFICE.

HAZEN MOOERS, OF CHICAGO, ILLINOIS.

## IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. 116,339, dated June 27, 1871.

*To all whom it may concern:*

Be it known that I, HAZEN MOOERS, of the city of Chicago, county of Cook and State of Illinois, have invented certain new and useful Improvements in Combined Water and Steam Furnaces; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 is a perspective view of a combined steam and water furnace, embodying my improvements. Fig. 2 is a vertical central section of the same, showing those parts which are at the right hand of line *a a*, drawn vertically through Fig. 1; and Fig. 3 is a cross-section or plan taken on line *x x*, drawn across Fig. 2.

Similar letters of reference indicate like parts in the several figures of the drawing.

My invention relates to an improvement in that class of furnaces used in heating buildings; and has for its object to so construct the same as to admit of regulating the temperature of the heat; and to that end consists in a combination of pipes arranged within the case containing the water, secured over the fire-box in such a manner as to allow the fire to pass into and through a portion of the pipes which form a part of the combustion-chamber; also, in the arrangement of air-pipes, the whole of which will be fully understood from the following description.

In the drawing, A represents the outer case or walls of the furnace, which may be constructed of metal, as shown, or may be made of masonry in the usual manner. B is the fire-box, which is arranged in the center of the walls of the furnace. C is the ash-box, and C' the grate. D is the flue communicating with the fire-box from the outer side of the furnace-walls. E is a cylindrical case, which is firmly secured within and to the walls of the furnace over the fire-box. F is a system of air-pipes, which are secured vertically within the said case E, as shown at *d*, and open at both ends, and arranged in such a manner as to allow of a free circulation of air through the same. G is a system of pipes, also open at both ends, and are secured vertically

within the case, and extend from the fire-box upward through the same. H is the smoke-chamber, which is firmly affixed to the upper surface of case E, and communicates with the fire-box through the respective pipes, as shown in Fig. 2; and to said chamber is attached a pipe, H', communicating with the flue of the chimney. J is a system of pipes which are closed at their upper ends, as shown at *e*, and are secured vertically within and to the bottom of case E, and communicate with the fire-box immediately over the same, thereby forming a part of the combustion-chamber. K is a system of hot-air pipes, which communicate with the registers of the different apartments in the usual manner. In using my improved furnace, the cold air is introduced into the outer case A through pipes (not shown) in the usual manner.

The operation of my invention is as follows: A sufficient amount of water is introduced into case E through a suitable pipe, (not shown,) and is heated to the desired temperature by means of the fire contained within the fire-box B passing into pipes J and through pipes G, thereby heating the air as it is passed through the outer system of pipes F, and which is conveyed to the different apartments in the usual manner.

The advantages derived from this construction of heaters are: the arrangement of pipes produce a greater heating surface within a given space; the application of water around the pipes prevents the same from being heated above steam-heat; and a building may be warmed to the desired temperature in the coldest weather, and also to the desired temperature in milder weather.

Having thus described the nature and object of my invention, what I claim as new, and desire to secure by Letters Patent, is—

The combination of the respective systems of pipes F, G, and J, arranged within case E, as described, the whole operating substantially in the manner and for the purpose specified.

The foregoing specification of my invention signed by me this 10th day of April, A. D. 1871.

HAZEN MOOERS.

Witnesses:

N. C. GRIDLEY,

N. H. SHERBURNE.